# SETUP YOUR OWN GRADING SUITE

COLOR GRADING CENTRAL™

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ONE OF THE MOST CHALLENGING PROBLEMS FOR A COLORIST IS TO ADDRESS THE PROBLEM OF CREATING AN ACCURATE GRADING ENVIRONMENT SO YOU CAN TRUST THAT WHAT YOU'RE SEEING ON YOUR SCREEN IS THE SAME AS WHAT VIEWERS WILL SEE ON THEIRS. I'M GOING TO EXPLORE THIS TOPIC WITH A SERIES OF VIDEOS THAT WILL COVER HOW TO SET UP A GRADING ENVIRONMENT AS WELL AS YOUR OPTIONS FOR MONITORING, CALIBRATION AND OTHER EQUIPMENT. THIS PDF GUIDE WILL SUPPLEMENT THE VIDEOS, GIVING YOU A QUICK REFERENCE FOR THE INFORMATION COVERED IN THE VIDEOS.

IF YOU LOOK ONLINE, THERE ARE TONS AND TONS OF ARTICLES AND BUYER'S GUIDES FOR SETTING UP YOUR OWN GRADING SUITE. MANY OF THEM OFFER GOOD ADVICE BUT ARE OFTEN GEARED TOWARDS COLORISTS WITH BIG EQUIPMENT BUDGETS, OR OUTLINE IDEALS THAT AREN'T REASONABLE FOR MOST PEOPLE. THERE'S ALSO AN ATTITUDE THAT'S PREVALENT ON THE INTERNET THAT IF YOU DON'T HAVE A "PERFECT" GRADING SUITE OR IF YOU DON'T SPEND ENOUGH MONEY, YOU'RE NOT A "REAL" COLORIST. THIS IS DEFINITELY NOT TRUE AS I'VE SEEN MANY SETUPS FOR MANY SUCCESSFUL COLORISTS THAT ARE LESS THAN IDEAL.

SO I'M GOING TO CUT THROUGH ALL THE NOISE WITH THESE VIDEOS AND THIS GUIDE AND APPROACH THE ISSUE FROM A "DO-IT-YOURSELF" STANDPOINT, SO THAT YOU CAN FEEL CONFIDENT WITH YOUR GRADING SETUP, WHETHER YOU WANT TO SPEND A LOT OF MONEY OR ONLY A LITTLE.

-DENVER RIDDLE
PRESIDENT, COLOR GRADING CENTRAL

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# INTRODUCTION

# SETUP YOUR OWN GRADING SUITE

## PART 1: SETTING UP YOUR ENVIRONMENT

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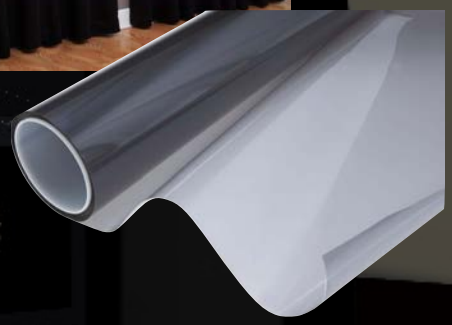
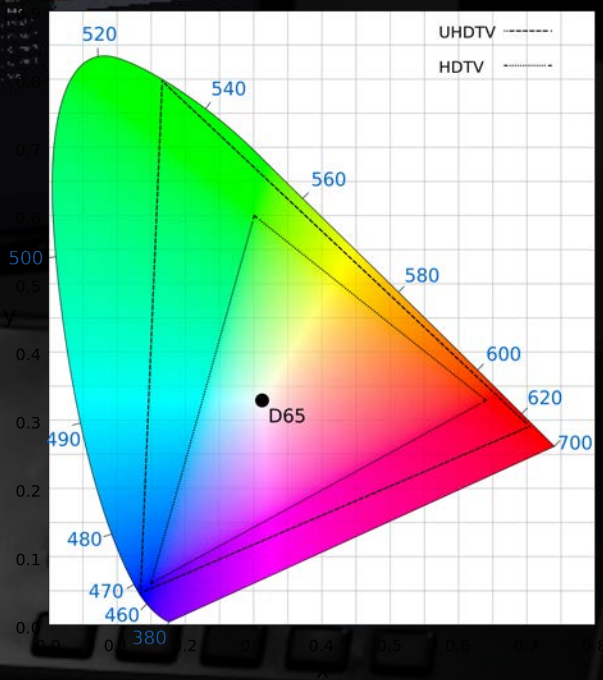
- BLOCK OUTDOOR LIGHTING
  - USE BLACKOUT CURTAINS
  - USE WINDOW TINTING IF NECESSARY



- USE 6500K LIGHTBULBS
  - MATCH THE D65 WHITE POINT OF YOUR MONITOR

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# CONTROL COLOR TEMPERATURE

- BACKLIGHT YOUR DISPLAY
  - REDUCES EYE STRAIN
  - GIVES YOUR EYES A NEUTRAL REFERENCE TO RESET

- DIAL IN BACKLIGHT BRIGHTNESS
  - DISPLAY A WHITE IMAGE
  - DIAL BACKLIGHT TO 10-25% BRIGHTNESS

- PAINT WALLS TO MATCH 18% GRAY
  - BUY 18% GRAY PAINT
  - HAVE PAINT STORE MATCH TO 18% GRAY CARD

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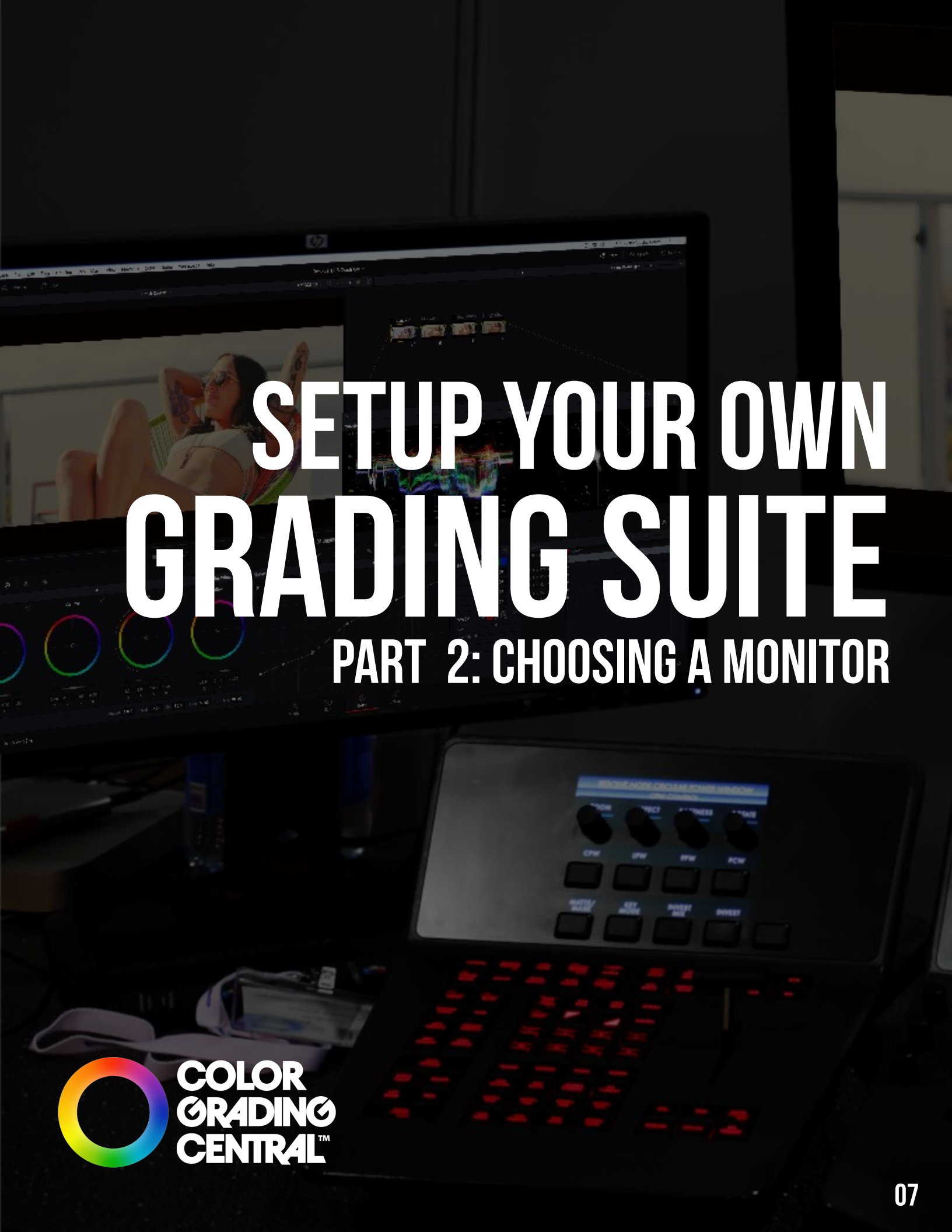
# CREATE A NEUTRAL REFERENCE



# SETUP YOUR OWN GRADING SUITE

## PART 2: CHOOSING A MONITOR

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# DISPLAY RESOLUTION

- IF YOU'RE PRIMARILY WORKING ON HD PROJECTS DESTINED FOR THE WEB, A 1080 HD MONITOR IS PROBABLY ADEQUATE

- IF YOU'RE WORKING WITH A LOT OF 4K (UHD) RESOLUTION FOOTAGE AND YOU'RE ON A HD MONITOR, DEGRADATION FROM DOWNSCALING MAY OCCUR

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## WHAT TO LOOK FOR IN A MONITOR

# INPUTS

- HD-SDI
  - FASTER AND SMOOTHER CONNECTION
  - CAN CARRY TIMECODE
  - REQUIRES EXTERNAL CONVERSION TO CARRY A 4K SIGNAL

- HDMI AND THUNDERBOLT
  - BOTH CONNECTIONS SUPPORT 4K
  - THUNDERBOLT 2 HAS HIGHER REFRESH RATE

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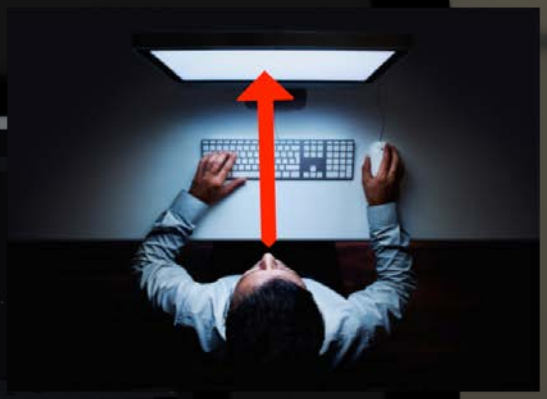
WHAT TO LOOK FOR
# IN A MONITOR

# SCREEN SIZE



- MEASURE HOW MANY INCHES YOU SIT FROM THE SCREEN
- DIVIDE THAT NUMBER BY 3
- RESULT WILL BE THE VERTICAL HEIGHT OF THE SCREEN

# CONTRAST RATIO

- MINIMUM 1,000:1 CONTRAST RATIO



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## WHAT TO LOOK FOR IN A MONITOR

## BLACK LEVELS

- BLACKS SHOULD BE DEEP AND RICH, BUT ALSO NEED TO MAINTAIN DETAIL
- PLASMA IS BEST, BUT MODELS ARE NOW DISCONTINUED
- OLED PRODUCES BEST BLACKS FOR CURRENT TECHNOLOGY

## CALIBRATION

- DOES THE MONITOR COME FACTORY CALIBRATED?
- DOES THE MONITOR HAVE BUILT-IN TOOLS?
- IF THE MONITOR ISN'T FACTORY CALIBRATED AND DOESN'T HAVE BUILT-IN TOOLS, A PROBE WILL BE NEEDED

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# WHAT TO LOOK FOR IN A MONITOR

# 8-BIT VS. 10-BIT

- 8-BIT DISPLAYS OVER 16 MILLION COLORS
- 10-BIT DISPLAYS OVER 1 BILLION COLORS
- MOST DISPLAYS DON'T SUPPORT 10-BIT
- MOST WEB-READY CODECS DON'T SUPPORT 10-BIT

# EXTERNAL HARDWARE

- EXTERNAL MONITORING REQUIRES HARDWARE, WHICH WILL BE AN ADDED EXPENSE
- VIDEO SIGNAL NEEDS TO BE ROUTED PROPERLY, SO A LITTLE BIT OF KNOWHOW WILL BE REQUIRED

# 5K IMAC

- 5,120 X 2,880 RESOLUTION
- 99.9% OF SRGB COLOR GAMUT
- CAN DISPLAY 10-BIT COLOR
- DEFINITELY NEEDS CALIBRATION, AS THESE MONITORS SHIP WITH EXTRA CONTRAST AND BLUE COLOR

# EIZO COLOREDGE

- 24-27” PRICED AROUND $1,000
- COME FACTORY CALIBRATED
- SOME MODELS HAVE BUILT-IN CALIBRATION TOOLS

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BUYER’S GUIDE

COMPUTER MONITORS

# HP DREAMCOLOR

- Z24X LESS EXPENSIVE THAN EIZO
- 100% OF SRGB COLOR GAMUT
- CAN DISPLAY 10-BIT COLOR
- SAME CONTRAST RATIO AS $1K EIZOS

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BUYER'S GUIDE

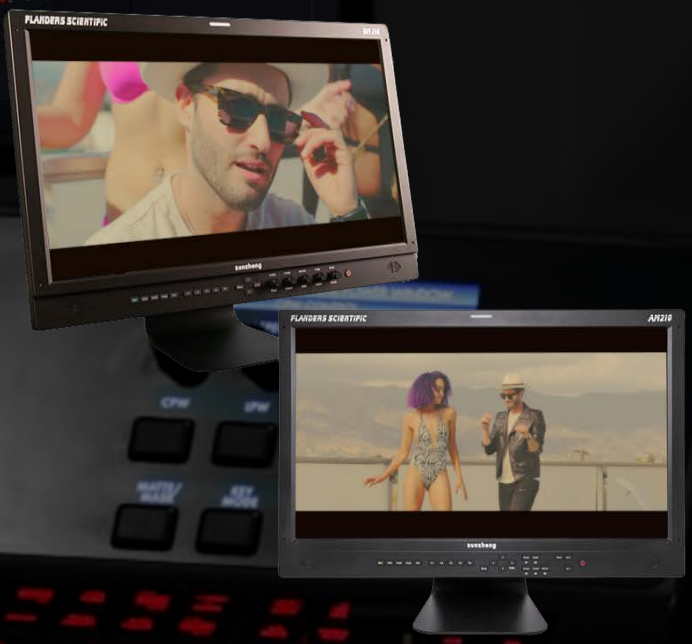
COMPUTER MONITORS

# BMD EXTERNAL HARDWARE

- DAVINCI RESOLVE LIMITS YOU TO BLACKMAGIC DESIGN HARDWARE
- A RANGE OF OPTIONS FOR ALL BUDGETS
- BMD HARDWARE IS WIDELY COMPATIBLE

# FLANDERS SCIENTIFIC

- AM210 & BM 210
- $2,000-$2,500 RANGE
- BUILT-IN SCOPES, BLUE-ONLY MODE
- FREE LIFETIME CALIBRATION

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BUYER'S GUIDE
EXTERNAL MONITORS

# FIELD PRODUCTION MONITORS

- FIELD PRODUCTION MONITORS ARE AVAILABLE AS LOW AS $600-$1,000
- MAKE SURE ANY MODEL YOU PURCHASE HAS A BLUE-ONLY MODE
- HIGHER END MONITORS ARE MORE THAN YOU NEED FOR WEB CONTENT

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BUYER'S GUIDE

EXTERNAL MONITORS

# SETUP YOUR OWN GRADING SUITE

## PART 3: MONITOR CALIBRATION

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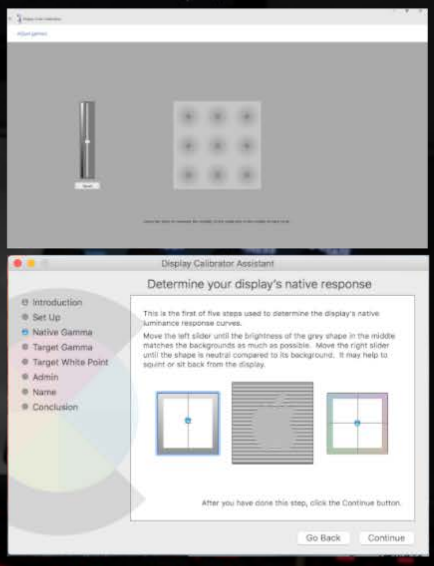
# DISPLAY PROFILERS/COLORIMETERS

- RUN A SOFTWARE TEST PATTERN IN FRONT OF A PROBE
- ADJUSTS GAMMA AND COLOR GAMUT OF MONITOR PROFILE
- USER CAN SELECT WHICH COLOR GAMUT TO MATCH TO

# OPERATING SYSTEM CALIBRATION

- WALKS USER THROUGH A STEP-BY-STEP PROCESS
- RELIES HEAVILY ON THE ACCURACY OF THE USER'S EYES

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# COMPUTER MONITOR CALIBRATION

# X-RITE I1DISPLAY PRO

- AROUND $250
- CAN CALIBRATE MONITORS AND PROJECTORS
- HAS AMBIENT LIGHT METER

# CALMAN RGB

- AROUND $200
- CAN CONTROL DISPLAY SETTINGS FROM THE SOFTWARE

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BUYER'S GUIDE

# DISPLAY PROFILERS

# DATACOLOR SPYDER5

- OFFERS A RANGE OF PRODUCT MODELS TO FIT ANY BUDGET

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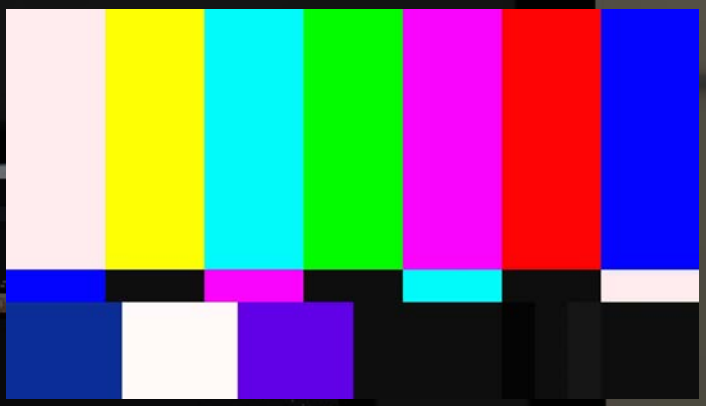
BUYER'S GUIDE
DISPLAY PROFILERS

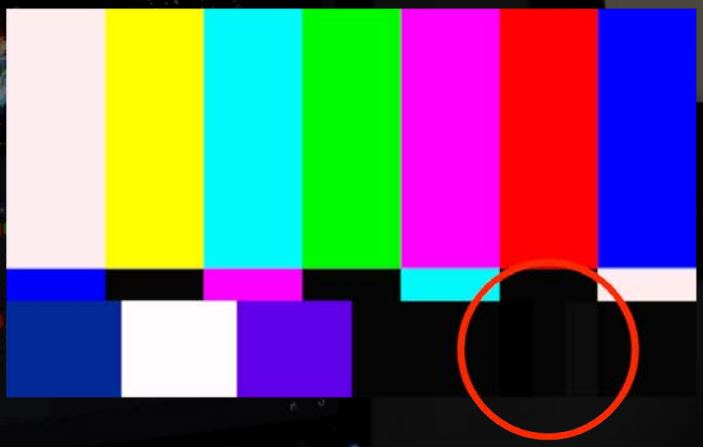
# TO MANUALLY CALIBRATE AN EXTERNAL MONITOR

1. DISPLAY SMPTE HD COLOR BARS.

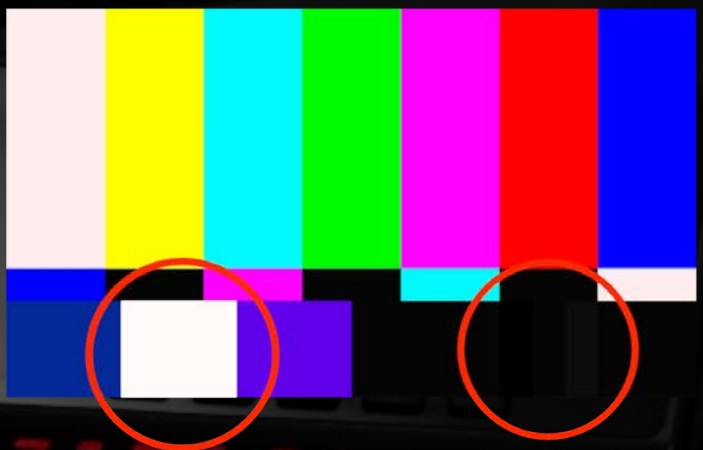


2. SET BRIGHTNESS, CONTRAST AND CHROMA CONTROLS ON MONITOR TO NEUTRAL SETTINGS . (USUALLY 50)

3. USING THE BRIGHTNESS CONTROL, ADJUST THE PLUGE UNTIL YOU CAN BARELY SEE THE RIGHTMOST BAR.



3. USING THE CONTRAST CONTROL, TURN IT UP UNTIL THE WHITE BOX ON THE LEFT SHOWS “FLARING” AND THE PLUGE DISAPPEARS. THEN DIAL BACK THE CONTRAST UNTIL THERE ARE SHARP EDGES ON THE WHITE BOX AND THE RIGHTMOST BAR OF THE PLUGE RETURNS.



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EXTERNAL MONITOR
# MANUAL CALIBRATION

# TO MANUALLY CALIBRATE AN EXTERNAL MONITOR

4. SET MONITOR TO BLUE-ONLY MODE.

5. ADJUST THE CHROMA CONTROLS UNTIL THE TOPS AND BOTTOMS OF THE VERTICAL BARS ARE THE SAME COLOR.

6. TURN OFF BLUE ONLY MODE

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EXTERNAL MONITOR
MANUAL CALIBRATION

1. DOWNLOAD DISPLAYCAL (DISPLAYCAL.NET)
2. CONNECT COMPUTER DIRECTLY TO MONITOR'S HDMI INPUT
3. CREATE CALIBRATED PROFILE WITH DISPLAYCAL
4. CREATE A 3D LUT WITH DISPLAYCAL 3D LUT MAKER
5. SAVE THE LUT TO THE LUT LOCATION OF YOUR APPLICATION
6. RECONNECT YOUR MONITOR THROUGH YOUR PLAYBACK DEVICE
7. APPLY THE LUT AS A 3D DISPLAY LUT IN YOUR APPLICATION

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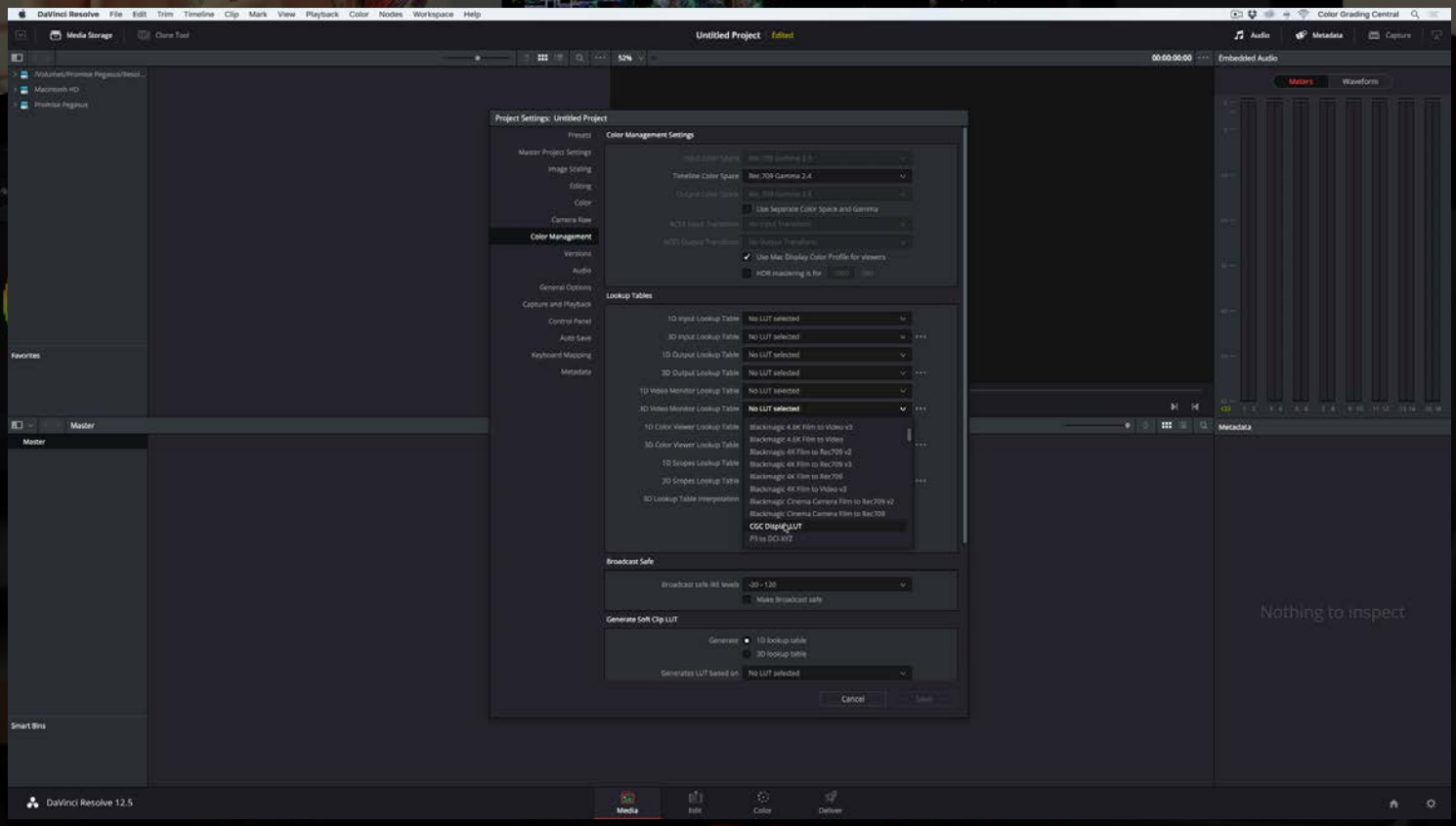
# EXTERNAL MONITOR PROBE CALIBRATION

## 1. STORE THE GENERATED 3D LUT IN RESOLVE'S LUT LOCATION

MAC: MACINTOSH HD/LIBRARY/APPLICATION SUPPORT/BLACKMAGIC DESIGN/DAVINCI RESOLVE/LUT

PC: C:/PROGRAMDATA/BLACKMAGIC DESIGN/DAVINCI RESOLVE/SUPPORT/LUT

## 2. APPLY THE LUT IN PROJECT SETTINGS->COLOR MANAGEMENT ->3D VIDEO MONITOR LOOKUP TABLE

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# DAVINCI RESOLVE LUT APPLICATION